

STATE OF SOUTH CAROLINA
BEFORE THE PUBLIC SERVICE COMMISSION

Docket No.: 2019-182-E

IN RE: South Carolina Energy Freedom Act (H.3659) Proceeding Initiated Pursuant to S.C. Code Ann. Section 58-40-20(C): Generic Docket to (1) Investigate and Determine the Costs and Benefits of the Current Net Energy Metering Program and (2) Establish a Methodology for Calculating the Value of the Energy Produced by Customer-Generators

**EXHIBITS TO DIRECT AND
REBUTTAL TESTIMONY OF
ALDER ENERGY SYSTEMS, LLC**

(DON ZIMMERMAN, MS, MBA, NABCEP)

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1. Exhibit DRZ-1 | *Letter from Duke Energy* to the Public Service Commission of South Carolina, September 21, 2020 (filed in docket 2019-169-E and 2019-170-E), <https://dms.psc.sc.gov/Attachments/Matter/67531f9f-36ae-4961-ab7b-e3b57309a71a>,
2. Exhibit DRZ-2 | *Published Utility Dive Article*, ‘Duke-solar industry breakthrough settlement aims to end rooftop solar cost shift debates,’ September 16, 2020, <https://www.utilitydive.com/news/duke-solar-industry-breakthrough-settlement-aims-to-end-rooftop-solar-cost/585124/>,
3. Exhibit DRZ-3 | *Published SEIA memorandum*, ‘Principles for the Evolution of Net Energy Metering and Rate Design,’ May 2017, <https://www.seia.org/initiatives/principles-evolution-net-energy-metering-and-rate-design>.



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September 21, 2020

VIA ELECTRONIC FILING

The Honorable Jocelyn G. Boyd
Chief Clerk/Executive Director
Public Service Commission of South Carolina
101 Executive Center Drive, Suite 100
Columbia SC 29210

**Re: Duke Energy Progress, LLC's Establishment of Net Energy Metering Tariff
in Compliance with H. 3659 and Duke Energy Carolinas, LLC's Establishment
of Net Energy Metering Tariff in Compliance with H. 3659
Docket Number: 2019-169-E & 2019-170-E**

Dear Ms. Boyd:

Duke Energy Carolinas, LLC ("DEC") and Duke Energy Progress, LLC ("DEP" and, together with DEC, the "Companies") are hereby providing the Commission with an update regarding the status of their collaboration with stakeholders on the issues at hand in the above-referenced dockets. On September 16, 2020, the Companies, along with the North Carolina Sustainable Energy Association, Sunrun Inc., Vote Solar, and the Southern Environmental Law Center on behalf of South Carolina Coastal Conservation League, Southern Alliance for Clean Energy, and Upstate Forever (collectively the "Parties to the Agreement") issued a press release in which they announced an agreement regarding the Companies' planned Solar Choice Metering tariff filing. A copy of the September 16, 2020 press release is enclosed.

The agreement between the parties builds on the goals of Act 62 and, if approved by the Commission, will provide options for customers while allowing the Companies to address increasing electric demand periods in the winter for the benefit of the Companies' systems and customers.

The agreement includes retail rates that vary based on the time of day and when utilities experience peak demand and it includes incentives for participation in a proposed demand response program that pairs the installation of smart thermostats with solar installation. The proposed rate design will send customers improved price signals to reduce consumption when power prices are high and will allow solar customers to maximize the value of self-consumption. When paired with a minimum bill, grid access fee for unusually large systems, and non-bypassable charges as explained below, the cost of public programs and the grid will be covered without imposing costs on non-solar customers, thereby minimizing any cost-shift in compliance with Act 62.

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The agreement also contains a grandfathering provision to protect current net energy metering customers and, if approved by this Commission, the Companies anticipate a transitional tariff will be available on June 1, 2021, to allow for a full transition into the new Solar Choice Metering Tariffs on or before January 1, 2022. While the Companies and the Parties to the Agreement plan on advancing the agreement with stakeholders and incorporating any appropriate additional changes or input from stakeholders prior to the November 2nd filing, the Companies and Parties to the Agreement are fully cognizant that any agreement must be considered by this Commission. The Companies also note that certain components will require approval from the North Carolina Utilities Commission as well.

Additional details about the agreement are listed below:

Interim Tariff:

- An interim tariff in which residential customers applying from June 1, 2021 through December 31, 2021 would remain on their existing rate schedule and be placed on a new net metering rider, which will include monthly netting with net excess energy applied as a bill credit at avoided cost and certain non-bypassable charges until May 31, 2029.

Solar Choice Metering Tariff:

- The Solar Choice Metering tariff will apply to all interested residential customers applying on or after January 1, 2022.
- A minimum monthly bill of \$30.00 for each Solar Choice Metering customer will be assessed to recover estimated customer and distribution costs. The minimum monthly bill is reduced by the basic facilities charge (“BFC”) and the portion of the customer’s monthly volumetric energy charges specific to customer and distribution costs.
- Proposed critical peak pricing (“CPP”) and time-of-use (“TOU”) rates as follows:

| | Prices without Riders and before future fuel cost adjustments (c/kWh) | |
|----------------|---|--------|
| | DEC SC | DEP SC |
| Peak | 15.4444 | 16.140 |
| Off-Peak | 9.0270 | 9.805 |
| Super-Off-Peak | 6.2952 | 7.294 |
| Critical Peak* | 25 | 25 |
| | | |

* Price for peak hours on up to 20 Company-designated Critical Price days per year

- Annual on-peak periods would be from 6:00 pm – 9:00 pm (Eastern Prevailing Time), with additional on-peak periods during the months of December-February from 6:00 am – 9:00 am. The super-off-peak period would be from March-November from 12:00 am – 6:00 am.

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- The designation of critical peak pricing days and hours would be set daily and posted on the Companies' website as the official customer notification, along with other possible means of notification.
- A monthly grid access fee for facilities with capacity in excess of 15 kW-dc. The proposed grid access fee is \$5.86/kW - dc/month for DEC and \$3.95/kW - dc/month for DEP (if approved), applied to the nameplate capacity in excess of 15 kW-dc.
- Inclusion of the Commission-approved BFC of \$13.09 for DEC and \$14.63 for DEP for customer electing to voluntarily subscribe to the Solar Choice Metering tariffs. The BFC would be used to reduce the customer's minimum bill.
- Customer's energy imports and exports would be netted within each TOU pricing tier and monthly net exports would be applied as a bill credit at avoided cost and this bill credit can be used to reduce a customer's bill after the minimum bill has been applied. CPP applies to all imports during the CPP hours. Any energy exports during the CPP hours will be netted against peak imports, not the Critical Peak imports.
- DSM/EE, storm cost recovery, and cyber security costs would be non-bypassable charges for Solar Choice Metering tariff customers.
- A \$0.36/Watt-dc incentive for new qualifying Solar Choice Metering tariff customers, which will be assignable to solar leasing companies. To receive this incentive, customers must enroll in the proposed winter smart thermostat program, which offers an additional upfront \$75 bill credit and then an annual bill credit of \$25. The cumulative impact of both incentives is \$0.39 cents/watt, if approved. This incentive will need to be approved in both South Carolina and North Carolina.
- To ensure broad technology inclusion, the Companies will work with stakeholders to identify other peak load reduction technologies that can be paired with solar in addition to the winter smart thermostat program. The minimum qualification is that the technology must lead to a reliable reduction of at least ~1 kW per hour during peak winter hours. The Companies commit to file such a program by June 1, 2022.
- A non-residential offering for customers applying for interconnection after June 1, 2021. These customers would be served under their existing tariff and the Solar Choice Metering rider, which would include monthly netting of excess energy that would be applied as a bill credit at avoided cost.

Although the agreement between the Companies and certain stakeholders was announced on September 16, nothing in the agreement will impact the schedule that has currently been set by the Commission for the Companies' Solar Choice tariff proceedings. The Companies and the other parties to the agreement plan to continue working through issues with other stakeholders in advance of the Companies' November 2, 2020 filings to this Commission. DEC and DEP are

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committed to continuing the cooperative spirit that has been a hallmark of these negotiations and hope to be able to present a comprehensive and collaborative filing for the Commission's consideration on November 2, 2020.

Sincerely,



Heather Shirley Smith

Enclosure

cc: Parties of record



News Release

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24-Hour: 800.559.3853

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Sept. 16, 2020

Duke Energy reaches deal with Vote Solar, Sunrun, renewable energy advocates to modernize, expand rooftop solar in South Carolina

- **Deal will create innovative pricing and incentives for residential solar customers**
- **Plan is latest step in implementing bipartisan, collaborative path for growth of renewables in the Carolinas**

GREENVILLE, S.C. – Duke Energy today announced an agreement with leading solar installers, environmental groups and renewable energy advocates that, if approved by regulators, will create long-term stability for the residential solar industry in South Carolina.

The deal will provide options for customers while allowing the company to address increasing electric demand periods in the winter for the benefit of the company's systems and customers in both North Carolina and South Carolina.

The proposed plan – Solar Choice Net Metering – could be the next generation of net energy metering for the Carolinas, a billing process that credits small customers with rooftop solar arrays for excess electricity they generate and provide to Duke Energy via the grid.

Solar Choice Net Metering will include retail rates that vary based on the time of day and when utilities experience peak demand. It will also give customers the ability to install a smart thermostat with their solar panels and receive an incentive for the combination.

"This first-of-a-kind package completely modernizes the rooftop solar transaction," said Lon Huber, Duke Energy's vice president for rate design and strategic solutions. "This new arrangement not only recognizes the value of solar and the enabling energy grid, but it unlocks additional benefits for all customers by addressing when utilities experience peak demand across their systems in the Carolinas."

Those organizations part of the effort include renewable energy advocates Vote Solar and North Carolina Sustainable Energy Association; the Southern Environmental Law Center on behalf of South Carolina Coastal Conservation League, Upstate Forever and Southern Alliance for Clean Energy; and leading rooftop solar installer Sunrun. Each organization that is part of the agreement will continue to advance the proposal to other stakeholders and ultimately regulators.

The agreement builds on the goals of the South Carolina Energy Freedom Act (Act 62). The 2019 legislation is the result of a collaborative and bipartisan effort to develop the next steps for energy policy in South Carolina that support the state's continued commitment to solar energy development.

"Collaboration brought us a pathway to growing renewables in the state with Act 62, and that spirit of working together created this plan for the continued expansion of solar in South Carolina," said Mike Callahan, Duke Energy South Carolina state president. "Duke Energy is committed to the cooperative spirit that has been a hallmark of achieving successful solar policy and creating a cleaner energy future for customers in South Carolina."

"Duke Energy deserves credit for its leadership in bringing stakeholders together, establishing trust through transparency, and embracing policy innovation," said Thad Culley, senior regional director for Vote Solar. "I am hopeful that this collaborative approach will encourage more partnerships with Duke Energy as we try to navigate our way toward a cleaner, more resilient grid, while providing additional choices for South Carolina families."

If approved by regulators, the company anticipates a transitional tariff to be available on June 1, 2021, to allow for a full transition into the new plan on or before Jan. 1, 2022.

Duke Energy

Duke Energy (NYSE: DUK), a Fortune 150 company headquartered in Charlotte, N.C., is one of the largest energy holding companies in the U.S. It employs 29,000 people and has an electric generating capacity of 51,000 megawatts through its regulated utilities and 2,300 megawatts through its nonregulated Duke Energy Renewables unit.

Duke Energy is transforming its customers' experience, modernizing the energy grid, generating cleaner energy and expanding natural gas infrastructure to create a smarter energy future for the people and communities it serves. The Electric Utilities and Infrastructure unit's regulated utilities serve 7.8 million retail electric customers in six states: North Carolina, South Carolina, Florida, Indiana, Ohio and Kentucky. The Gas Utilities and Infrastructure unit distributes natural gas to 1.6 million customers in five

states: North Carolina, South Carolina, Tennessee, Ohio and Kentucky. The Duke Energy Renewables unit operates wind and solar generation facilities across the U.S., as well as energy storage and microgrid projects.

Duke Energy was named to Fortune's 2020 "World's Most Admired Companies" list and Forbes' "America's Best Employers" list. More information about the company is available at [duke-energy.com](https://www.duke-energy.com). The [Duke Energy News Center](#) contains news releases, fact sheets, photos, videos and other materials. Duke Energy's [illumination](#) features stories about people, innovations, community topics and environmental issues. Follow Duke Energy on [Twitter](#), [LinkedIn](#), [Instagram](#) and [Facebook](#).

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DEEP DIVE

Duke-solar industry breakthrough settlement aims to end rooftop solar cost shift debates

Successor tariff deal reshapes solar with dynamic rates, demand response requirements

By Herman K. Trabish

Published Sept. 16, 2020

A landmark settlement between Duke Energy and distributed energy resources (DER) advocates in North and South Carolina could remake the rooftop solar sector and be a model for ending regulatory disputes across the country.

The proposal, released Sept. 16, could calm contention between utilities and solar advocates over the perceived "cost shift" some utilities and policymakers see as a subsidy for rooftop solar paid by non-solar-owning customers. The settlement would, if approved by Duke's North and South Carolina regulators, pair rooftop solar with smart DER devices and time-varying rate designs to add to the utility's demand response capability and give customers an incentive to help address the utility's peak demand challenges.

"This is a totally new framework that treats self-consumed solar paired with demand response as energy efficiency and includes rate design innovations in dynamic pricing," said Duke Energy Vice President for Rate Design and Strategic Solutions Lon Huber.

"We eliminate the cost shift, but retain a vibrant solar market,

which could be a paradigm-changing win in the national net metering debate."

Legislative and regulatory conflicts continue to increase nationally over replacing the retail rate net energy metering (NEM) tariff typically paid to solar owners for electricity exported to utility systems, said North Carolina Clean Energy Technology Center (NCCETC) Senior Policy Program Director Autumn Proudlove. "Some states have delayed action, but the approved changes have reduced compensation."

Successor tariff debates ultimately slow rooftop solar growth, according to Proudlove. But Duke and other utilities who see how customer-owned DER can cost-effectively help reduce peak demand and meet policy goals are working with stakeholders across the country on ways to take advantage of those DER investments without imposing costs on other customers.

The new proposal, developed in response to solar policy directives in South Carolina's 2019-enacted Act 62, and North Carolina's 2017-enacted House Bill 589 (HB589), can accomplish those objectives, according to representatives of Duke, Sunrun, Vote Solar, the Southern Environmental Law Center (SELC) and the North Carolina Sustainable Energy Association (NCSEA) who helped shape the settlement.

Fights over NEM

NEM compensates rooftop solar owners for the generation their arrays send to the grid, and is available in 40 U.S. states and Washington, D.C. Compensation is set at the same retail rate customers pay for electricity, unless successor tariffs are in place that adjust that compensation.

NEM was deployed state by state to support early renewables growth. Retail rate compensation was a proxy for the value of the exported generation. Since at least 2013, utilities have complained about NEM to regulators, arguing its reduction in solar-owning customers' bills shifts system costs to the rest of the customer base. Solar advocates argue NEM benefits all utility customers by reducing operational costs.

The result is often-heated conflicts between utilities and solar advocates over a successor tariff that would theoretically represent the true value of distributed solar but prevent an undue shift of costs to non-solar-owning customers. The Duke settlement aims to eliminate some of those debates through rate design and smart technologies.

In many states, compensation debates "have been quite contentious" because utilities "want to reduce or eliminate the cost shift and have proposed compensation at avoided costs or wholesale rates," Proudlove said. Solar advocates are "realistic about coming changes," but want cost-benefit or value-of-solar studies to set a compensation that matches the value of their exported generation.

South Carolina's Act 62 required review of the retail rate NEM provision by regulators in 2021 and North Carolina's HB589 required a review by 2027. With successor tariff debates likely and Duke subsidiaries the dominant electricity providers in both states, it made sense for stakeholders to work toward a plan, NCSEA General Counsel Peter Ledford said.

The proposal, which the settlement partners described as "unprecedented" and "paradigm-changing," has special significance because solar has struggled in the Southeast, regulators have been and continue to be hard on NEM

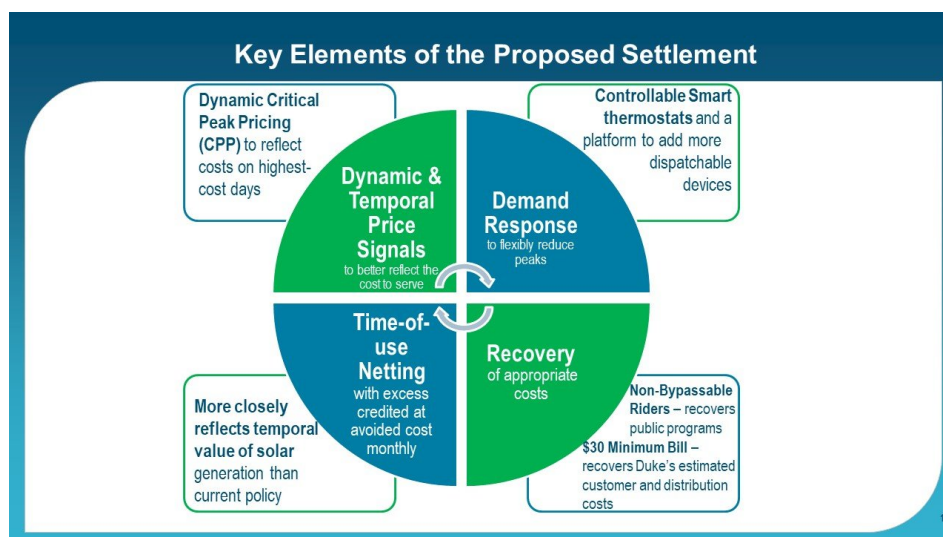
policies, and installed solar capacity has only recently begun to match the region's resource potential.

Southern Company subsidiary Alabama Power's retail rate is \$0.1337/kWh, but based on concerns about a cost shift, pays solar owners only a regulator-approved \$0.035/kWh for exported electricity, SELC reported in 2019. And, in July, the utility won regulatory approval for one of the region's "highest solar-specific monthly charges," said SELC Senior Attorney and Solar Power Initiative Leader Lauren Bowen.

In Florida, the 2019 regulatory approval of solar leasing, combined with the state's NEM, led to a boom in rooftop solar, Southern Alliance for Clean Energy (SACE) Energy Policy Attorney for Florida George Cavros reported Sept. 11. By the end of 2019, there were "nearly 60,000 customer-owned net-metered systems." But there was also a call for regulatory review of the NEM policy, Cavros reported.

"It is a pattern around the country," Bowen said. "At a certain rooftop solar penetration, the need for a variation on net metering is raised."

The North and South Carolina bills' requirements that retail rate NEM be reviewed make successor tariff debates likely and a new approach practical now, stakeholders said.



Permission granted by Duke-solar settlement group

A sustainable solution

The settlement participants see the new proposal as a sustainable way to end the NEM and successor tariff debates.

"Collaborations on successor tariffs often produce piecemeal, short-term agreements," Vote Solar Senior Regional Director and Regulatory Counsel Thad Culley said. "This proposal is a comprehensive and paradigm-changing solution and should hold up over the long term."

The settlement proposal brings together time-of-use (TOU) rates, critical peak pricing (CPP) and incentives for participation in Duke's demand response programs, Sunrun Director for Public Policy Tyson Grinstead said. "No one piece is the perfect solution, but the package as a whole preserves the critical underpinnings of net metering."

It offers an upfront rebate for adding a smart thermostat that Duke could use to shed or shift customer usage and manage peak demand, he added. Taken as a whole, the benefits would be "as good as with net metering," Grinstead said.

The high-level Act 62 objectives required eliminating the cost shift, ensuring the solar market remain uninterrupted and offered the option of time-varying rates and other strategies, Huber said. "The settlement's combination of policy elements addresses those objectives and incorporates best practices for those options from other states into a scalable long-term framework."

The CPP and mandatory TOU rates send solar-owning customers improved price signals to reduce consumption when power prices are high, Huber said. "Along with monthly netting, solar owners will be able to maximize the value of self-consumption. A minimum bill, grid access fee, and non-bypassable charges assure that the cost of public programs and the grid are covered" without imposing costs on other customers.

Models of the settlement plan suggest a 92% or more reduction of the Duke-calculated cost shift from solar owners to non-solar-owners, Huber added. "The plan would increase solar owners' current average payback for their rooftop systems from 11 years to about 14 years, but with the demand response program incentives, it would likely come back in line with today's payback."

NCSEA has crunched the numbers, Ledford said. "This will not work for every customer in every situation, but we think the payback will make rooftop solar a good deal." Vote Solar's Culley agreed the plan "will offer good cost savings," if solar owners respond to price signals, and also noted it has a grandfathering provision that will protect current solar owners.

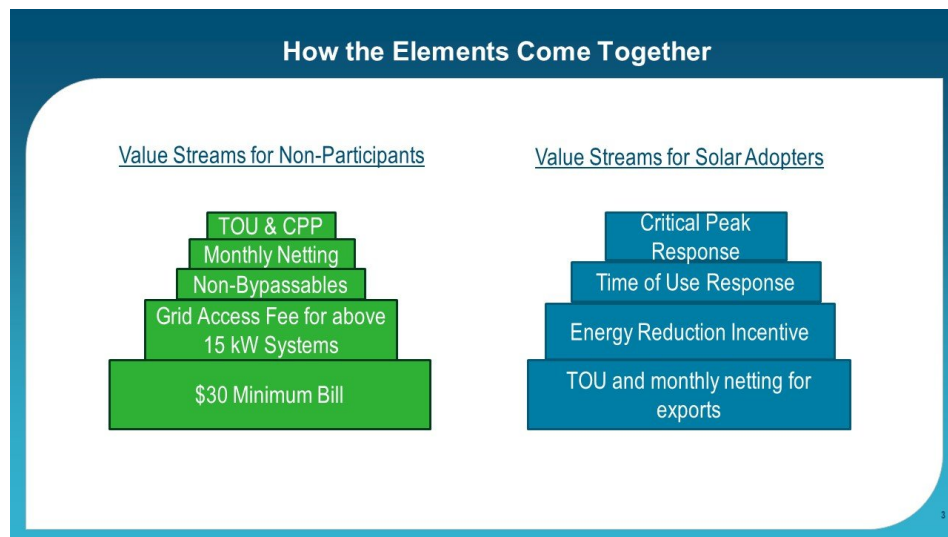
The plan's incentive will initially be available only to customers with smart thermostats, but eventually other flexible DERs will be eligible, Huber said. "If North Carolina and South Carolina regulators approve the proposal, customers' self-consumed solar and dispatchable demand response would be part

of Duke's 'shared savings' energy efficiency program, making rebates eligible for cost recovery," he added.

If that happens, the utility would be allowed to recover the same 10.6% of the net benefits from utility savings that is allowed for any other technology in Duke's energy efficiency program, he said. And that makes it "in shareholders' interest for Duke customers to add rooftop solar."

DER advocates defended the utility's cost recovery. It is an expenditure "that allows customers to invest their own capital to build a more distributed and reliable grid," Sunrun's Grinstead said. "That is a win-win."

Duke shareholders "should be able to earn on efficiency investments because it puts those investments on a level playing field with other capital investments that shareholders earn returns on," NCSEA's Ledford agreed. That is "a policy decision that was made in North Carolina 15 years ago and has played out well."



Permission granted by Duke-solar settlement group

Will regulators approve?

The proposal now faces regulatory review from two commissions.

"Duke's Carolinas system shares the costs of energy efficiency programs between the states, and both state commissions have to approve them," Huber said. Settlement partners are optimistic South Carolina regulators will approve because the proposal meets Act 62's objectives, but North Carolina approval is less certain, Huber said.

The energy efficiency provision is a key strength in North Carolina "because Duke has never had satisfactory visibility or control of DER on its system and that is a practical operational difficulty," NCSEA's Ledford said. This proposal resolves that because the smart thermostat provides visibility and some control over customer usage, protects the solar market's financial calculus, and protects and benefits customers not interested in solar, he added.

"It is too soon to say the North Carolina commission will approve it, but much of this has been negotiated between the utility and [solar] industry advocates who work in both states," Ledford said. "Opponents may not see this as a perfect solution, but once they look at the numbers, they will understand why it is a good compromise."

There are also uncertainties in South Carolina, said Grinstead, a former aide to Sen. Lindsey Graham, R-S.C. "Four new commissioners will be appointed to the seven-member commission by the legislature later this year and one of the first things they will take up is this settlement."

But the proposal meets Act 62's objectives, which will make approval more likely, VoteSolar's Culley said, agreeing with Huber. And in North Carolina, "if Duke and NCSEA agree on a settlement, as they did with HB589, it is likely to get approval."

While Huber is cautiously optimistic about approval in the Carolinas, he is also looking ahead. "This can guide the rest of the country on how to look at rooftop solar, and how to move beyond our traditional way of separating rooftop solar from other demand-side resources."

Principles for the Evolution of Net Energy Metering and Rate Design



This document provides a consensus view of solar advocates for regulators and stakeholders considering rate design and compensation for distributed solar generation, including potential alternatives to net energy metering. Traditional net energy metering (NEM) is fundamentally a bill credit that represents the full retail value of distributed electricity delivered to the distribution system, and has been a critical policy for valuing and enabling distributed generation. As penetration of solar and other distributed energy resources increases, states and utilities have begun to examine, and in some cases implement, alternative rate and compensation mechanisms.

The principles below are intended to be consistent with the imperative of public utility commissions and energy service providers to maintain reliable, cost-effective service to all customers while protecting the rights of customers to generate their own energy in a manner that provides both system and public benefits, including environmental protection and economic development.

They provide high level criteria for the conditions under which states may wish to consider alternatives to NEM, and high level principles for what distributed solar compensation mechanisms should look like where alternatives to NEM are appropriately considered.

Specifically the paper is organized into four sections:

- ❖ Basic principles, foundational to considerations for considering rate design and compensation for distributed solar generation.
- ❖ Criteria and Conditions for the Consideration of Alternatives to Net Energy Metering
- ❖ Guiding Principles for Solar Rate Design, and
- ❖ Guiding principles for Alternative Compensation

Basic Principles¹

- ❖ Customers have a right to reduce their consumption of grid-supplied electricity with energy efficiency, demand response, storage, or clean distributed generation. Thus, a customer should always receive the full retail price value for behind the meter

¹ The Criteria and Principles herein do not distinguish between regulated and restructured states. However, rate designs, cost allocation methods, avoided costs and cost/benefit analyses must recognize whether the utility is distribution-only or vertically integrated.

Principles for the Evolution of Net Energy Metering and Rate Design

choices that reduce grid-supplied energy consumption, whether installing energy efficiency measures, or consuming on-site generation.

- ❖ Solar rate design and compensation mechanisms should support customer economics to invest in solar that are sustainable, consistent with the full stream of values provided by the system, and fair to all stakeholders.
- ❖ Net energy metering is a proven mechanism for driving solar deployment, liked and understood by customers, and is preferred in most circumstances.
- ❖ Most studies have shown that the benefits of distributed solar generation equal or exceed costs to the utility or other customers where penetration is low. Assertions that current or future solar customers have shifted or will shift costs to others, and/or create new costs, must be demonstrated with valid, transparent data that reflects the values, avoided utility costs, and results of deploying solar at the distribution level, as well as the utility cost of providing service.
 - A cost of service study that fails to consider the benefits of distributed solar generation (DSG) cannot establish a cost-shift.
 - Regulators should require an independent cost-benefit analysis before considering substantial rate design or compensation changes based on cost-shift assertions.
 - The benefits of existing distributed solar should be recognized when considering any asserted cost shift.
 - The time frame for review of costs and benefits must be on par with the life of the particular type of Distributed Energy Resources (DER) assets, e.g. 20-30 years, and be forward looking, not a snapshot of one year of sunk costs as is typical in a general rate case (GRC).
 - Regulators should seek to ensure in GRC, Integrated Resource Plans (IRP) and other relevant proceedings that future avoided costs found in cost/benefit studies related to DSG and other DER are *actually* avoided (e.g. the canceled PG&E transmission projects saving \$200 million and the Brooklyn-Queens Demand Management project avoiding costly upgrades).
 - Since some level of quantifiable cross-subsidization is inherent in all rate design, particularly for large diverse classes, an independent finding of a *material* cost shift should be required before regulators authorize substantial changes to rates or rate design.
- ❖ Net metering can be accomplished through simple energy netting, or in combination with monetary compensation depending on the rate design:
 - For non-time differentiated residential and small commercial rates, i.e. rates based on energy consumed at any time, energy netting on a kWh basis over the billing period is good policy particularly at low to moderate penetration levels, and pending demonstration of a material impact.

Principles for the Evolution of Net Energy Metering and Rate Design

- For time-differentiated rates, monetary compensation is an accepted feature of some current NEM structures and may be necessary to preserve the full value of excess energy.
- ❖ Opportunities for retail customers and third party DSG and other DER developers to provide additional services (e.g. voltage & frequency regulation, VAR support) should be encouraged, especially in States moving towards a service oriented utility/regulatory model, though access to markets, and appropriate compensation mechanisms.
- ❖ Consideration of creating separate rate classes for customers that choose to utilize DER technologies must be based upon a factual demonstration of significantly different load and cost characteristics using publicly available actual data, and should generally be discouraged as potentially discriminatory.

Criteria and Conditions for the Consideration of Alternatives to Net Energy Metering

- ❖ Penetration level should be the leading threshold criteria for consideration of alternatives to NEM.
- ❖ Customers who installed solar under net metering should be grandfathered for a reasonable period of time. Customers have a reasonable expectation that rate structures (as opposed to rates themselves) will not change dramatically. Gradualism is an important rate design principle, and a gradual phase-in to any new compensation methodology should be provided at the end of the grandfathering period.
- ❖ Process: Early, i.e. pre-litigation, data collection and analysis under the guidance of the State Commission can provide opportunities for collaboration toward the development of a factual basis for future changes to rate designs, compensation, and other mechanisms.
- ❖ Simplicity, Gradualism, and Predictability: The simplicity of the NEM compensation mechanism facilitates customer adoption of distributed solar. Any future design should consider customer needs for simplicity and any changes should be applied gradually and predictably.
- ❖ Shadow billing and voluntary pilot programs to analyze opportunities to increase the benefits that net metered systems provide to the grid, and to assess the actual impacts of proposed changes (for example, time-of-use (TOU) pilot programs) should be considered before making substantial mandatory changes to compensation or rate design.
- ❖ Hold harmless policies should be in place for low-to-moderate income (LMI) customers.
- ❖ NEM imports & exports are generally netted monthly in most states, and trued up annually. More granular netting generally reduces solar customer economics, but may be worthy of consideration when penetration levels increase, or in conjunction with deployment of other DERs such as storage.

Principles for the Evolution of Net Energy Metering and Rate Design

Guiding Principles for Solar Rate Design

- ❖ Rate design should seek to send clear price signals to customers that encourage sustainable, cost-effective investments in solar and complementary technologies.
- ❖ Rate designs should not create barriers to the deployment of distributed solar generation or DER technologies other than solar.
- ❖ Rate designs that provide greater incentives for DER technology deployment (e.g. more steeply inverted block rates) can be considered to encourage early adoption of efficiency, distributed generation and storage technologies.
- ❖ Rate designs that emphasize temporal cost-causation (time-varying, critical peak pricing and critical peak rebates) are generally consistent with solar deployment, and may be quite beneficial to customer and system alike when solar is integrated with DERs like storage or demand response.
- ❖ Rate designs that emphasize higher fixed (e.g. customer, service and facility or basic service) charges than necessary for recovery of strictly customer-related costs like service drop, billing, and metering, or quasi-fixed (e.g. mandatory residential demand) charges do not reflect cost causation, disproportionately impact low and moderate income customers, and should be discouraged.
- ❖ Regulatory review of rate design alternatives should consider impacts on low-income customers; e.g. utility fixed or quasi-fixed charge proposals usually put solar and efficiency technologies further out of reach of LMI customers.
- ❖ Any consideration of standby, backup or other supplemental charges for solar customers must (1) be consistent with PURPA requirements, (2) be based upon a customer's ability to control self-generation similar to a conventional fossil resource (e.g. diesel or natural gas), and (3) reflect the probability of customer generation unavailability in the development of any rates.

Guiding principles for Alternative Compensation

- ❖ A fair value of solar (or "stacked benefit") compensation rate can be considered for distributed solar generation exports, at higher penetration levels. Such value should be determined taking into account both short term and long term (life of system) benefits of distributed solar generation.
- ❖ Buy all/Sell all (BA/SA or "VOST") compensation approaches should be at the option of the retail customer, i.e. VOST should not be the only customer option. Critical considerations impacting system economics and the ability to finance include the frequency and effect of future changes to the value proposition. In addition, consideration must be given to the effect on customers of the lack of energy hedging (customer-generated solar energy does not offset the customer's utility-supplied energy).
- ❖ Alternative Compensation methods should take into account the efficacy of integrating solar with other forms of DER (e.g. storage) in the grid of the future, assuring that barriers to new technologies are not created.

Principles for the Evolution of Net Energy Metering and Rate Design

- ❖ Solar specific surcharges such as installed capacity fees are discriminatory, generally unsupported by facts, and impede distributed solar generation system economics.